NEW TECHNICAL THEORY
FOR SERVICING

DHC-MD555
CONTROL I & MD WALKMAN LINK
OPERATION MANUAL

MINI Hi-Fi COMPONENT SYSTEM

SONY ®

Contents

1. CONTROL I

1-1. NAME

CONTROL I

1-2. SCOPE OF APPLICATION

The CONTROL I terminal has been adopted from system stereos DHC-MD555, DHC-MD777, and JMD-7. Connecting by the PC connection kit PCLK-PX1 and bi-directional remote commander RM-IA10K (J model only) to the CONTROL I terminal facilitates basic operations of the system stereo, music editing from CD to MD, and title inputs to MDs.

The terminals connecting the optional cassette decks TC-PX100 and TC-SD1 of the above system stereo have different connector shapes, but adopt the same communication format as CONTROL I.

1-3. COMPATIBILITY

CONTROL I has no compatibility with the conventionally used AU BUS in terms of both connector shape and communication format.

CONTROL I also has no compatibility with the CONTROL-A1 adopted for the component stereo in terms of connector shape and communication format.

Although CONTROL I has a similar name with i-LINK using the IEEE1394 terminal which thus may cause them to be confused for one another, these two have no compatibility.

1-4. BASIC CONCEPT

Communication is carried out by the I2C bus between the microprocessors inside the system stereo. In CONTROL I, a special terminal is equipped to enable communication by this I2C bus with the microprocessor of an external equipment, and at the same time, a terminal for turning ON the power of the system stereo from an external equipment has also been added.

1-5. SHAPE OF TERMINAL

The CONTROL I terminal uses a MINI DIN 6-pin connector.

This connector is used for DOS/V PC keyboards and PS/2 mouse, but it has no compatibility with the communication format.

However, taking into account connection to this connector by mistake, power and GND pin positions are made the same to prevent incorrect operations.
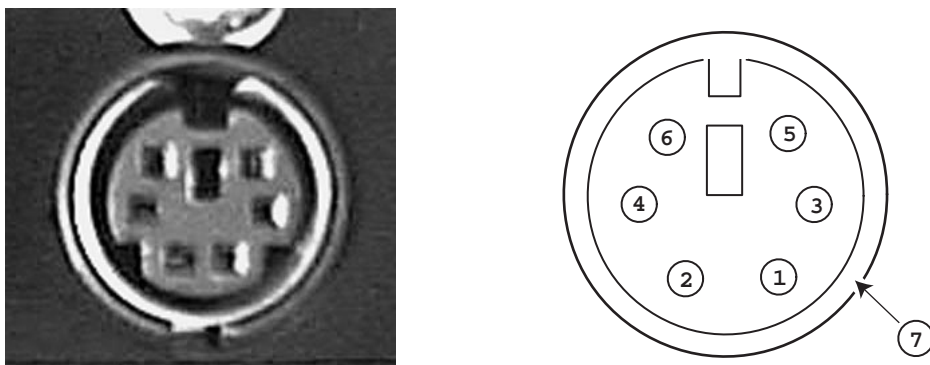

Fig. 1-1. CONTROL I Terminal

Table 1-1. Function of CONTROL I Terminal

No	I/O	Terminal Name	Function
1	I/O	SDA	Serial data input/output terminal
2	–	NC	No Connect (OPEN)
3	–	GND	Grounding terminal
4	–	VDD	+5V terminal
5	I/O	SCL	Serial clock input/output
6	I	POWER ON	Power on signal input terminal
7	–	FRAME GND	Grounding terminal

The terminal for the earlier mentioned optional TC is of the 5-pin type used for system cables, etc. The serial data of the SDA terminal uses the same signal format as CONTROL I.
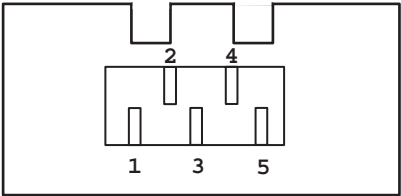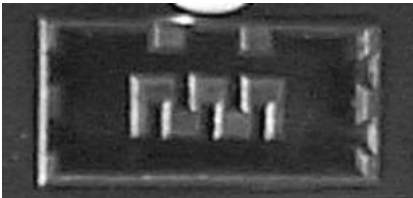

Fig. 1-2. Optional TC Terminal

Table 1-2. Function of Optional TC Terminals

No	I/O	Terminal Name	Function
1	I/O	SDA	Serial data input/output terminal
2	I/O	HELP	Normal:H, when the microprocessor is abnormal:L
3	–	GND	Grounding terminal
4	–	VDD	+5V terminal
5	I/O	SCL	Serial clock input/output

1-6. DESCRIPTION OF TERMINALS

The following describes the terminals of CONTROL I.

(1) I2C Bus Communication Terminal

SDA (I2C serial data):1 pin
SCL (I2C serial clock):5 pin

In the communication between microprocessors inside the current system stereo, the DATA line is expanded to four lines based on the AU BUS, and a 6-line Y BUS with additional CLK and BUSY lines is used as the internal bus. System stereos after DHC-MD555, DHC-MD777, and JMD-7 however adopt the Phillips "I2C format" for the communication format of the internal bus.

The I2C format bus is able to send a higher volume of data than the conventional Y-BUS using two lines serial data (SDA) and serial clocks (SCL) and at high speed. By performing this I2C bus using the system stereo terminal, high speed communication between the system stereo internal microprocessor and microprocessor of external equipments is possible.

The microprocessor incorporated in the CAV-PX1 connection cable of the PC connection kit PCLK-PX1 and microprocessor incorporated in the transmitter receiver of the bi-directional remote control RM-IA10K communicate with the microprocessor of the system stereo via the CONTROL I terminal.

The microprocessor of the optional cassette deck TC-PX100 and TC-SD1 communicates with the system stereo microprocessor via a exclusive connector.

(Reference) Rounding of signal

When the I2C bus inside the system stereo is connected to an external equipment using a connection cable, rounding of waveform occurs from the effects of the stray capacitance of the cable. When the cable is longer and the stray capacitance increases, the rounding of the waveform increases, and may disable communication of the I2C bus.

For this reason, I2C dedicated buffer ICs are used for both the system stereo and external equipment to prevent I2C bus effects even when the cable is connected.

(Important) Operations During Sleep

When the power of the system stereo is in the STAND BY state, all functions are stopped except for some microprocessor functions in order to decrease the power consumption. In this sleep mode, no communication operations by the I2C bus communication terminals SDA and SCL are possible.

In the sleep mode, as the power of the I2C buffer IC is also turned off, the internal I2C bus and buffer ICs are cut off by the MOS-FET switch to prevent incorrect operations by the effects of the external equipment.

(2) Power supply terminal

VDD:4 pin

+5V is supplied from the system stereo only when the system stereo is in the power ON state. No power will be supplied in the STAND BY state.

The I2C buffer IC in the system stereo and I2C buffer IC of the external equipment operate with this power. It prevents from that the communication becomes impossible after one power is turned off.

The connection cable CAV-PX1 of the PCLK-PX1 incorporates the internal I2C buffer IC, 12C-RS232C conversion microprocessor, and RS232C driver IC. These IC powers are all supplied at +5V from the system stereo.

The main power supply of the RM-IA10K transmitter receiver is supplied by the AC adapter. Only the power of the I2C buffer IC is supplied from the system stereo. Although the optional TC also has its own power supply, only the power of the I2C buffer IC is supplied from the system stereo.

When the power of the system stereo is ON, if the power of the above external equipment is OFF, power is supplied from the system stereo to the I2C buffer IC in the external equipment. But, this power is cut by the MOS-FET SW between the I2C buffer IC and the microprocessors of external equipment, and therefore has no effect on the I2C bus of the system stereo.

(Reference) Power supply of CONTROL-A1

The power of the connection CAV-50C of the MDS-PC1 and PCLK-MD1 using the CONTROL-A1 terminal is created from the RS232C signal of the PC and is not supplied from the component stereo.

(3) Power ON terminal

POWER ON:6 pin

Input port for turning on the power of the system stereo from an external equipment when the system stereo is in the STAND BY state. It is connected to the main microprocessor (microprocessor for controlling the power supply)of the system stereo.

The POWER input terminal of the main microprocessor is pulled up to H by the VDD. When the power on signal (L) from an external equipment is input, the unit sets into the power on state.

Excessive noise may be output when the external equipment is turned on, etc. To prevent the power from turning on due to incorrect operations by noises, the following POWER ON signal format is used.

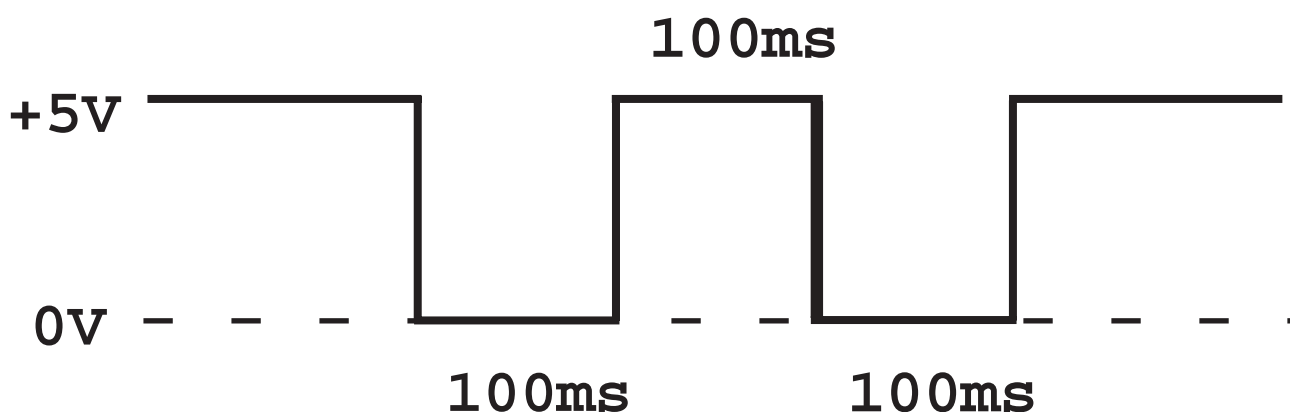Power on : L (100ms) ⟶ H (100ms) ⟶ L (100ms)

```
               100ms
+5V  ┌─────┐     ┌─────┐     ┌───────
     │     │     │     │     │
0V  ─ ─ ─ └─────┘ ─ ─ └─────┘ ─ ─ ─ ─
           100ms         100ms
```

Fig. 1-3. Power ON Signal

(4) Others

NC (OPEN):2 pin
Connected to nothing.

VDD:3 pin
GND terminal where current supplied from the +5V power is returned.

FRAME GND:8 pin
Shield part of the MINIDIN cable. Same as GND.

(Reference) Optional cassette deck signal (2pin:HELP)

Sets to L when data communication errors of the I2C bus are generated and retransmission is requested. Errors are usually not generated.

2. MD WALKMAN LINK

2-1. OUTLINE

(1) Function

The liquid crystal remote controller of the MD Walkman receives the liquid crystal display data output from the MD Walkman and displays the name of the disc played, name of the track played, etc. The MD WALKMAN LINK function uses the audio output and liquid crystal display output to the liquid crystal remote control to perform analog dubbing.

When the MD Walkman and system components such as DHC-MD555 are connected using the link cable (MDLK-PX1) for MD Walkman, analog synchro recording and automatic track number setting can be performed using the headphone signal output from the MD Walkman.
Using the liquid crystal display data output from the MD Walkman, disc names and track names can be edited.

The MD WALKMAN LINK function is a one-directional dubbing function for dubbing from the MD Walkman to the system component.

(2) Precautions on Connections

Connect the side of the MD link cable with the cylindrical ferrite core to the MD Walkman. If the opposite side is connected, errors may occur during data transmission.
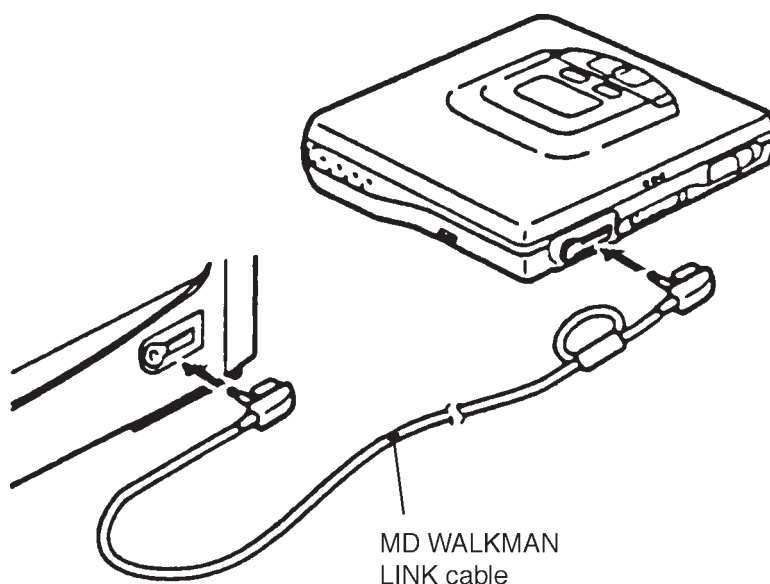

MD WALKMAN
LINK cable

Fig. 2-1. Connecting Method

Settings for the MD Walkman to display the progress time and track number must be performed using the DISPLAY button of the MD Walkman.

(3) Settings of MD Walkman Sound

The MD Walkman link function requires to set the recording level due to the use of the headphone outputs of the MD Walkman for the recording source. If this setting is not performed, the sound may become small or distorted.
After recording, lower the volume of the MD Walkman.

Required settings
• Turn OFF the MEGA BASS (emphasis of bass sounds) switch of the MD Walkman.
• After turning ON the AVLS (volume limit) switch of the MD Walkman, set the volume of the remote control to maximum.
• Set FUNCTION (source) of the system stereo to "MD WALKMAN".

(4) Transmission of Track Name Data

If the song being recorded has a name, press the NAME EDIT button of DHC-MD555 to edit or copy the name. The track name cannot be recorded automatically for copyright reasons.

*Maximum number of characters transmittable

Up to 255 bytes (255 ASCII characters) can be transmitted for one track.

2 bytes are used for one Japanese kana character. As other special symbols are also added, the number of characters that can be transmitted is almost halved.

*Time required for data transmission

Transmission is performed in packets (7 characters). Transmission of one packet takes about 100 ms for the MD player and about 40 ms for the MD recorder.

*Missing data

If errors occur during transmission and reception due to effects of noise during data transmission, data will be lost in units of packets. In this case, the lost data will not be included in the track name displayed.

For example, in the transmission of the track name 1234567ABCDEFG123, three packet data "1234567", "ABCDEFG", and "123" will be sent. Should transmission or reception error at the second packet, the track name will be displayed as "1234567123".

*Illegal characters in data

Illegal characters may be displayed rarely and randomly when the portable MD recorder is used. In this case, correct with the editing function.

(5) Automatic setting of track number

Only at the start of recording, detection that the sound data has exceeded a certain level will be performed, after which recording will be started. After this, the track number will be set based on track data output from the MD Walkman. For this reason, the level synchro recording function does not work during recording.

*Incorrect track number setting

Track numbers may be assigned to positions different from playback when the portable MD recorder is used. In this case, reassign track position by using the editing function.

When the portable MD player for playback is used, track numbers are assigned to the same position as that during playback.

2-2. LINK CABLE
(1) Terminal
The link cable consists of the following terminals. (Refer to Fig. 2-2.)

Table 2-1. Function of Terminals

No	I/O	Terminal Name	Function
1	O	R	Right channel audio terminal.
2	O	L	Left channel audio terminal.
3	–	1/2 VDD	Grounding terminal for remote control. (A. GND)
4	–	GND	Grounding terminal. (D. GND)
5	I	REMOTE	Remote control key detection terminal. When a remote control key is pressed, the voltage corresponding to the key will drop.
6	I/O	DATA	Input/output terminal of the serial data for liquid crystal control.
7	O	R-VCC	Power supply of the liquid crystal remote control. Approx. 3V.

I/O indicates the input/output of the MD Walkman.

7: VCC
6: DATA
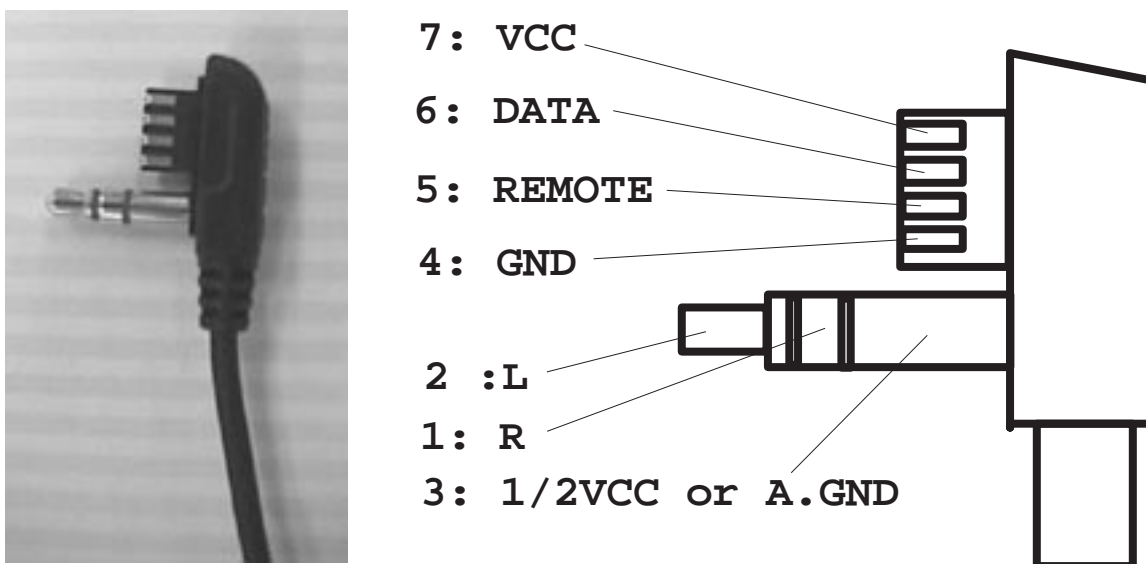5: REMOTE
4: GND
2 :L
1: R
3: 1/2VCC or A.GND

Fig. 2-2. MD Walkman Link Cable Terminal

The link cable terminals consist of the music data terminals and remote control data terminals. The remote control key pressed is detected by the changes in the voltage of the REMOTE terminal. The remote control display data is also transmitted by the serial data of the DATA terminal.

(2) Data signal (DATA:6 pin)

Bi-directional communication is performed between the MD Walkman and system controller of the system stereo.
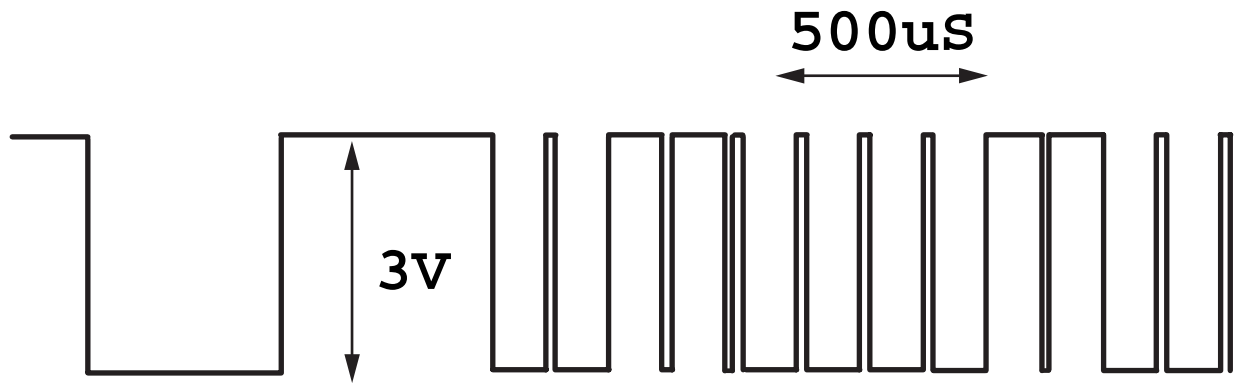
500uS

3V

Fig. 2-3. Data Signal

Liquid crystal display data is periodically output from the system controller of the MD Walkman. To copy the track name data, the data transmission request command is output to the DATA terminal from the system controller of the system stereo, and the track name data is transmitted from the system controller of the MD Walkman.

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